Title Section and Volume Contents for Volume 35 (1991)

The Annals of Occupational Hygiene

AN INTERNATIONAL JOURNAL

PUBLISHED FOR THE

BRITISH OCCUPATIONAL HYGIENE SOCIETY

EDITOR
DR J. McK. ELLISON
London

EDITORIAL ASSISTANT
MRS M. MacLAREN

HON. ASSISTANT EDITORS
MR R. N. J. BARRACLOUGH DR C. A. VEYS

PERGAMON PRESS

Oxford • New York • Seoul • Tokyo

ANNALS OF OCCUPATIONAL HYGIENE

Editor
Dr J. McK. Ellison

Editorial Assistant
Mrs M. MacLaren

Editorial Board
Mr R. N. J. Barraclough (Editor, reviews) } *Hon. Assistant Editors*
Dr C. A. Veys

Dr T. Carter
Dr K. Donaldson
Dr L. Levy
Dr P. Oldershaw
Dr S. Roach
Dr J. H. Vincent

Board of Overseas Editors

Professor M. Corn, *School of Hygiene and Public Health, The Johns Hopkins University, 615 North Wolfe St, Baltimore, MD 21205, U.S.A.*

Professor L. Friberg, *The Karolinska Institute, Dept of Environmental Hygiene, S-104 01 Stockholm 60, Sweden.*

Dr G. W. Gibbs, *Safety Health Environment International Consultants Corp., Box 27, Site 17, RR2, Winterburn, Alberta, Canada T0E 2N0.*

Dr J. J. van Hemmen, *TNO Medical Biological Laboratory, P.O. Box 45, 2280 AA Rijswijk ZH, The Netherlands.*

Dr T. Kauppinen, *Institute of Occupational Health, Topeliuksenkatu 41 aA, SF 00 250 Helsinki, Finland.*

Dr Y. Matsumur, *National Institute of Industrial Health, 21-1, Nagao 6 chome, Tama-ku, Kawasaki 213, Japan.*

Professor S. M. Rappaport, *School of Public Health, University of North Carolina, Chapel Hill, NC 27599, U.S.A.*

Professor R. Rylander, *Department of Environmental Hygiene, University of Gothenburg, Box 33031, S-400 33 Göteborg, Sweden.*

Dr R. S. J. du Toit, *Department of National Health and Population Development, National Centre for Occupational Health, 106 Joubert St Extension, P.O. Box 4788, Johannesburg 2000, Republic of South Africa.*

Professor E. C. Vigliani, *Largo Richini, 2, 20122 Milan, Italy.*

Publishing offices: Headington Hill Hall, Oxford OX3 0BW, U.K.

Annual Institutional Subscription Rate (1992): £235.00 (U.S. $375.00). Two-year Institutional Rate (1992/93): £446.50 (U.S. $712.50). Sterling prices are definitive. U.S. dollar prices are quoted for convenience only, and are subject to exchange rate fluctuation. Personal subscription rate for those whose library subscribes at the regular rate is available on request. Prices include postage and insurance and are subject to change without notice. Subscription rates for Japan are available on request. Published bimonthly. Subscription enquiries from customers in North America should be sent to: Pergamon Press Inc., 395 Saw Mill River Road, Elmsford, NY 10523, U.S.A., and for the remainder of the world to: Pergamon Press plc, Headington Hill Hall, Oxford OX3 0BW, U.K.

Back issues: Back issues of all previously published volumes, in both hard copy and on microform are available direct from Pergamon Press offices.

Published Bimonthly

Copyright © 1992, British Occupational Hygiene Society

It is a condition of publication that manuscripts submitted to this journal have not been published and will not be simultaneously submitted or published elsewhere. By submitting a manuscript, the authors agree that the copyright for their article is transferred to the British Occupational Hygiene Society if and when the article is accepted for publication. However, assignment of copyright is not required from authors who work for organizations which do not permit such assignments. The copyright covers the exclusive rights to reproduce and distribute the article, including reprints, photographic reproductions, microform or any other reproductions of similar nature and translations. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form, or by any means, electronic, electrostatic, magnetic tape, mechanical, photocopying, recording or otherwise, without permission in writing from the copyright holder.

Photocopying information for users in the U.S.A.: The Item-fee Code for this publication indicates that authorization to photocopy items for internal or personal use is granted by the copyright holder for libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service provided the stated fee for copying beyond that permitted by Section 107 or 108 of the United States Copyright Law is paid. The appropriate remittance of $3.00 per copy per article is paid directly to the Copyright Clearance Center Inc., 27 Congress Street, Salem, MA 01970.

Permission for other use. The copyright owner's consent does not extend to copying for general distribution, for promotion, for creating new works, or for resale. Specific written permission must be obtained from the publisher for such copying.

Whilst every effort is made by the publishers and editorial board to see that no inaccurate or misleading data, opinion or statement appear in this journal, they wish to make it clear that the data and opinions appearing in the articles and advertisements herein are the sole responsibility of the contributor or advertiser concerned. Accordingly, the publishers, the editorial board and editors and their respective employees, officers and agents accept no responsibility or liability whatsoever for the consequences of any such inaccurate or misleading data, opinion or statement.

The text paper used in this publication meets the minimum requirements of the American National Standard for Information Sciences—Permanence of Paper for Printed Library Materials, ANSI Z39.48-1984.

The Item-fee Code for this publication is: 0003-4878/91 $3.00 + 0.00

VOLUME 35 CONTENTS

NUMBER 1

T. Okuno	1	Thermal effect of infra-red radiation on the eye: a study based on a model
M. Xu, D. Han, S. Hangal and K. Willeke	13	Respirator fit and protection through determination of air and particle leakage
R. C. Brown, E. A. Sara, J. A. Hoskins and C. E. Evans	25	Factors affecting the interaction of asbestos fibres with mammalian cells: a study using cells in suspension
M. R. Flynn and C. T. Miller	35	Discrete vortex methods for the simulation of boundary layer separation effects on worker exposure
R. J. Gardner and P. J. Oldershaw	51	Development of pragmatic exposure-control concentrations based on packaging regulation risk phrases
Review		
S. M. Rappaport	61	Assessment of long-term exposures to toxic substances in air
Book Reviews		
R. I. McCallum	123	*Assessment of Inhalation Hazards. Integration and Extrapolation Using Diverse Data.* Edited by W. Mohr, D. V. Bates, D. L. Dungworth, P. N. Lee, R. O. McClellan and F. J. C. Roe
S. M. Rappaport	125	*BOHS Technical Handbook No.* 1, *Some Applications of Statistics in Occupational Hygiene.* By P. Dewell
News Items	127	Dr Charles A. Veys, O.B.E.
	128	Death of Sheila Coppock
	i	New Patents

NUMBER 2

R. M. Agius, J. Nee, B. McGovern and A. Robertson	129	Structure activity hypotheses in occupational asthma caused by low molecular weight substances
J. A. Groves and P. A. Ellwood	139	Gases in agricultural slurry stores
G. A. Mellström	153	Comparison of chemical permeation data obtained with ASTM and ISO permeation test cells—I. The ASTM standard test procedure
G. A. Mellström	167	Comparison of chemical permeation data obtained with ASTM and ISO permeation test cells—II. The ISO/DIS standard test procedure
M. Hery, M. Villa, G. Hubert and P. Martin	181	Assessment of the performance of respirators in the workplace
R. Pääkkönen and J. Tikkanen	189	Attenuation of low-frequency noise by hearing protectors
D. Wake, R. Gray and R. C. Brown	201	Assessment of industrial vacuum cleaners of both wet and dry types for use in potteries

P. J. Hewitt and A. A. Hirst	223	Development and validation of a model to predict the metallic composition of flux cored arc welding fumes
Short Communication		
P. Kirkwood, P. J. Trenchard, A. R. Uzel and P. J. Colby	233	SARAH: an expert system for training non-hygienists in carrying out occupational hygiene assessments
Letters to the Editor		
F. W. Lunau	239	Review of *Indoor Air Quality and Ventilation*—Reply
F. J. C. Roe	241	Review of *Indoor Air Quality and Ventilation*—Reply
Book Reviews		
F. J. C. Roe	243	*Advances in Modern Environmental Toxicology*. Edited by M. A. Mehlman
F. Gill	244	*Indoor Air Quality and Ventilation*. Edited by F. Lunau and G. L. Reynolds
News Item	247	Formation of a BOHS Special Interest Group (SIG) on Occupational Hygiene Information Systems

NUMBER 3

L. Gradoń and A. Podgórski	249	Kinetics of particle retention in the human respiratory tract
J. Malchaire and P. Mairiaux	261	Strategy of analysis and interpretation of thermal working conditions
N. van den Hoed and O. L. J. van Asselen	273	A computer model for calculating effective uptake rates of tube-type diffusive air samplers
A. Burdorf and A. Monster	287	Exposure to vibration and self-reported health complaints of riveters in the aircraft industry
S. K. Rastogi, B. N. Gupta, T. Husain, B. S. Pangtey, S. Srivastava and N. Garg	299	Long-term effects of soldering fumes upon respiratory symptoms and pulmonary function
M. E. Andersen	309	Physiological modelling of organic compounds
G. Johanson	323	Modelling of respiratory exchange of polar solvents
Short Communications		
E. S. Hodgson and C. Ruis-Frutos	341	A case report of contaminated operating theatre multi-purpose equipment: a potential hazard for health care workers
Mohan Das, S. K. Bhargava, A. Kumar, A. Khan, R. S. Bharti, B. S. Pangtey, G. S. Rao and K. P. Pandya	347	An investigation of environmental impact on health of workers at retail petrol pumps
Chairman's Review		
R. J. Sherwood	353	Occupational Hygiene Standards Committee of The British Occupational Hygiene Society and The Institute of Occupational Hygienists
S. C. Soderholm	357	Correction
	i	New Patents

NUMBER 4

J. H. Vincent, R. J. Aitken, D. Mark and R. A. Botham	359	Scale model studies of the transport of airborne pollutants on coalfaces
R. J. Gardner, J. Hampton and J. S. Causton	377	Inhalation anaesthetics—exposure and control during veterinary surgery
G. M. Brown, D. M. Brown and K. Donaldson	389	Inflammatory response to particles in the rat lung: secretion of acid and neutral proteinases by bronchoalveolar leucocytes
A. Hamill, J. Ingle, S. Searle and K. Williams	397	Levels of exposure to wood dust
R. Niemelä, A. Lefevre, J. P. Muller and G. Aubertin	405	Comparison of three tracer gases for determining ventilation effectiveness and capture efficiency
A.-T. Karlberg, A. Boman and B. Melin	419	Animal experiments on the allergenicity of *d*-limonene—the citrus solvent
R. A. Graveling	427	The prevention of back pain from manual handling
Short Communications		
R. S. J. Du Toit	433	An estimate of the rate at which crocidolite asbestos fibres are cleared from the lung
T. D. Stansbury	439	COSHH in workshops and garages
Book Reviews		
N. West and T. Carter	443	*Maximum Concentrations at the Workplace and Biological Tolerance Values* 1989
E. King	445	*Biological Monitoring of Exposure to Chemicals: Metals*. Edited by H. K. Dillon and M. H. Ho
E. King	448	*IPCS Environmental Health Criteria* 107. *Barium*. World Health Organization, Geneva
	451	Other Books Received
News Items		
C. D. Burgess and L. S. Levy	453	CEC Scientific Expert Group on Occupational Exposure Limits—a review of progress 1990–1991
	456	8th French Annual Meeting on Aerosols
	i	New Patents

NUMBER 5

J. T. Carter	457	Health, hygiene, work and wealth—Warner Lecture 1991
Z. Adamis and B. K. Krass	469	Studies on the cytotoxicity of ceramic respirable dusts using *in vitro* and *in vivo* test systems
G. Lidén and L. C. Kenny	485	Comparison of measured respirable dust sampler penetration curves with sampling conventions
A. W. Moll van Charante, C. J. Snijders and P. G. H. Mulder	505	Posture control and the risk of industrial accident: a stabilographic investigation in a naval shipyard

S. Puledda and A. Marconi	517	Study of the count-to-mass conversion factor for asbestos fibres in samples collected at the emissions of three industrial plants
A. Sato	525	The effect of environmental factors on the pharmacokinetic behaviour of organic solvent vapours
T. J. Smith	543	Pharmacokinetic models in the development of exposure indicators in epidemiology
Letter to the Editor C. Fletcher, M. Gilson, R. Gilson and R. Schilling	561	John Gilson Chair of Occupational Medicine
Book Reviews F. J. C. Roe	563	*Evaluating Effectiveness of Primary Prevention of Cancer*. Edited by M. Hakama, V. Beral, J. W. Cullen and D. M. Parkin
C. S. Bowring	564	*The Risks from Radon in Homes*. H. H. S. C. Handbook No. 5
	567	Erratum

NUMBER 6

H. P. A. Illing	569	Extrapolating from toxicity data to Occupational Exposure Limits: some considerations
J. Jankovic, W. Jones, J. Burkhart and G. Noonan	581	Environmental study of firefighters
Å. M. Hansen, I. L. B. Olsen, E. Holst and O. M. Poulsen	603	Validation of a high-performance liquid chromatography/ fluorescence detection method for the simultaneous quantification of fifteen polycyclic aromatic hydrocarbons
J. Malchaire and A. Piette	613	Relation between vibration levels and perceptive and appreciative judgements of overhead crane operators
M. Vanhoorne, L. van den Berge, A. Devreese, E. Tijtgat, L. van Poucke and C. van Peteghem	619	Survey of chemical exposures in a viscose rayon plant
J. J. G. Opdam	633	Linear systems dynamics in toxicokinetic studies
Short Communications A. B. Hansen, E. Larsen, L. V. Hansen, M. Lyngsaae and H. Kunze	651	Elemental composition of airborne dust in the Shale Shaker House during an offshore drilling operation
B. Järvholm, P.-A. Zingmark and B.-G. Österdahl	659	*N*-Nitrosodiethanolamine in commercial cutting fluids without nitrites
Committee Report J. W. Cherrie and B. S. Bord	665	The Joint Education and Training Committee of the BOHS, IOH and BEBOH—a discussion on the future of occupational hygiene education and training in the U.K.
Letters to the Editor D. Heederik, H. Kromhout and J. Burema	671	Assessment of long-term exposures to toxic substances in air

Contents

S. M. Rappaport	674	Assessment of long-term exposures to toxic substances in air—reply
Book Reviews		
F. J. C. Roe	675	*Environmental Health Criteria* 109: *Summary Report on the Evaluation of Short-term Tests for Carcinogens* (*Collaborative Study on* in vivo *tests*). WHO, Geneva
D. Hedley Williams	676	*BOHS Technical Guide No.* 8, *The Thermal Environment*
Video Review		
P. Oldershaw	679	*Qualified to Manage*
News Item	681	First International Scientific Conference of the International Occupational Hygiene Association
	i	New Patents